UNITED STATES PATENT AND TRADEMARK OFFICE

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09/692,884	10/20/2000	Kenneth R. Owens	4910.00003	6113

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EXAMINER
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ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	**Applicant(s)**
Office Action Summary	09/692,884	OWENS ET AL.
	Examin r	**Art Unit**	
	Jason E Mattis	2665	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _08 November 2004_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-24_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-24_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
       application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

DETAILED ACTION

1.   This Office Action is in response to the request for continued examination filed on

11/08/2004. Claims 17-24 have been added. Claims 1-24 are currently pending in the

application.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-2, 4-5, 7-11, and 13-24 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Cao et al. (U.S. Application 09/318694) in view of McAllister et al.

(U.S. Pat. 6697329).

With respect to claim 1, Cao et al. discloses a multi-protocol label switching

system comprised of a plurality of data switches, label switching routers, that are

interconnected by a plurality of data paths from a source node, LSR S, to a destination

node, LSR E, through a first set of data switches, LSR A and LSR B **(See paragraph 22**

and Figure 1 of Cao et al. for reference to an MPLS data network comprised of

label switching routers interconnected by paths). Cao et al. also discloses a

method within the MPLS data network of establishing a data flow over a protection path

from a source switch, LSR S, to a destination switch, LSR E, through a second set of

switches, LSR C and LSR D **(See paragraph 24 and Figure 1 of Cao et al. for**

reference to switching to a secondary path when a primary path fails). Cao et al.

further discloses sending a first message to establish a working data path and a

protection path from a first switch, LSR S, to a second switch, LSR E **(See paragraph**

23-24 and Figure 1 of Cao et al. for reference to sending a router request

downstream to request an explicitly routed path between source LSR S and

destination LSR E and for reference to establishing a secondary route between

source LSR S and destination LSR E). Cao et al. does not disclose sending a second

message from the second switch to the first switch establishing a reverse notification

path through the network between the second and first switches. Cao et al. also does

not disclose sending a third message over the reverse notification path in response to

the second switch receiving data from the first switch in order to control protection

switching by the first switch.

With respect to claim 1, McAllister et al., in the field of communications,

discloses sending a message establishing a reverse notification path through the

network between the first and second switches **(See column 9 line 47 to column 10**

line 8 of McAllister et al. for reference to using a path from a second node to a

first node to send "poll" and "stat" acknowledgement messages from the second

node to the first node in response to protocol messages, the second message,

sent from the first node). McAllister et al. also discloses sending a third message

over the reverse notification path in response to the second switch receiving data from

the first switch in order to control protection switching by the first switch **(See column 9 line 47 to column 10 line 8 of McAllister et al. for reference to the messaging being in a "poll" and "stat" format, meaning that a third acknowledgement, or "stat", message is sent from the second node in response to receiving a "poll" message, which is data from the first node).** Setting up a reverse notification path and sending signals over the path to a first, source, node has the advantage of allowing a first, source, node to learn about a failure in a data path and immediately stop sending packets that will be "lost" on the failed path before the source node switches to the secondary path and also allowing the source node to resend packets on the secondary path that may have been "lost" while the destination node was receiving packets through the failed path.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of McAllister et al., to combine setting up a reverse notification path and sending signals over the path to a first node to allow the first node to control protection switching, as suggested by McAllister et al., with the MPLS protection path system of Cao et al. with the motivation being to allow a first, source, node to learn about a failure in a data path and immediately stop sending packets that will be "lost" on the failed path before the source node switches to the secondary path and also allow the source node to resend packets on the secondary path that may have been "lost" while the destination node was receiving packets through the failed path.

With respect to claim 2, Cao et al. discloses that the step of sending a first message is comprised of the step of adding a protection messaging field, which carries protection pathway information between switching elements, to a label distribution protocol message **(See column 24 and Figure 1 of Cao et al. for reference to using label distribution protocol to establish label switching paths to set up primary and protection data paths)**.

With respect to claim 4, Cao et al. discloses that the step of sending a message to establish a working path and a protection path between the first and second switches, LSR S and LSR E, includes the step of identifying at least one data switch, LSR S, as a switch element by the contents of at least one control field sent to at least one data switch, LSR E, of the MPLS network **(See paragraph 23-24 and Figure 1 of Cao et al. for reference to LSR S using control fields sent through the network to LSR E to request an explicitly routed path identifying itself as the source LSR)**.

With respect to claim 5, Cao et al. discloses that the step of sending a first predetermined message to establish a working path and a protection path between the first and second switches, LSR S and LSR E, includes the step of identifying at least one data switch as a protection switch element, LSR C and LSR D, by the contents of at least one control field sent to at least one data, switch LSR E, of the MPLS network **(See paragraphs 23-24 and Figure 1 of Cao et al. for reference to LSR S using control fields to identify LSR C and LSR D as protection switch elements and sending this control information through the network to LSR E)**.

With respect to claim 7, Cao et al. discloses the working path being set up

loosely **(See paragraph 2 of Cao et al. for reference to prior art using loosely

connected working and protection paths set up hop-by-hop)**.

With respect to claim 8, Cao et al. discloses the working path being set up

. explicitly **(See paragraph 21 of Cao et al. for reference to explicitly setting up

working and protection routing paths)**.

With respect to claim 9, Cao et al. discloses a step for mapping labels to data

routed along the working path according to predetermined criteria that includes the

quality of service granted to the data **(See paragraph 53 and Figure 2 of Cao et al. for

reference to mapping labels routed along the first path according to

predetermined criteria including a type of service field, which includes quality of

service information)**.

With respect to claim 10, Cao et al. discloses a multi-protocol label switching

system comprised of a plurality of data switches, label switching routers, that are

interconnected by a plurality of data paths from a source node, LSR S, to a destination

node, LSR E, through the data switches, LSR A and LSR B **(See paragraph 22 and

Figure 1 of Cao et al. for reference to an MPLS data network comprised of label

switching routers interconnected by paths)**. Cao et al. also discloses a method

within the MPLS data network of routing data from a working path through the network

to a protection path through the network **(See paragraph 24 and Figure 1 of Cao et al.

for reference to switching·to a secondary path when a primary path fails)**. Cao et

al. further discloses sending a first control message to establish a working data path

and a separate protection path from a first switch, LSR S, to a second switch, LSR E

(See paragraph 23-24 and Figure 1 of Cao et al. for reference to sending a router

request downstream to request an explicitly routed path between source LSR S

and destination LSR E and for reference to establishing a secondary route

between source LSR S and destination LSR E). Cao et al. does not disclose sending

a second message from the second switch to the first switch establishing a reverse

notification path through the network between the second and first switches. Cao et al.

also does not disclose sending a third message over the reverse notification path from

the second switch to the first switch in response to the second switch receiving data

from the first switch, the interruption of which controls protection switching by the first

switch.

With respect to claim 10, McAllister et al., in the field of communications,

discloses sending a message establishing a reverse notification path through the

network between the first and second switches **(See column 9 line 47 to column 10**

line 8 of McAllister et al. for reference to using a path from a second node to a

first node to send "poll" and "stat" acknowledgement messages from the second

node to the first node in response to protocol messages, the second message,

sent from the first node). McAllister et al. also discloses sending a third message

over the reverse notification path the interruption of which controls protection switching

by the first switch **(See column 9 line 47 to column 10 line 8 of McAllister et al. for**

reference to sending a "stat", or a third message, which the first node uses, by

determining when the acknowledgement "stat" message was not rec iv d, or

interrupted, to control protection switching from the second node to the first

node). Setting up a reverse notification path and sending signals over the path to a

first, source, node has the advantage of allowing a first, source, node to learn about a

failure in a data path and immediately stop sending packets that will be "lost" on the

failed path before the source node switches to the secondary path and also allowing the

source node to resend packets on the secondary path that may have been "lost" while

the destination node was receiving packets through the failed path.

It would have been obvious to one of ordinary skill in the art at the time of the

invention, when presented with the work of McAllister et al., to combine setting up a

reverse notification path and sending signals over the path to a first node to allow the

first node to control protection switching, as suggested by McAllister et al., with the

MPLS protection path system of Cao et al. with the motivation being to allow a first,

source, node to learn about a failure in a data path and immediately stop sending

packets that will be "lost" on the failed path before the source node switches to the

secondary path and also allow the source node to resend packets on the secondary

path that may have been "lost" while the destination node was receiving packets

through the failed path.

With respect to claim 11, Cao et al. discloses that sending a first message is

comprises adding a protection messaging field, which carries protection pathway

information between switching elements, to a label distribution protocol message **(See**

column 24 and Figure 1 of Cao et al. for reference to using label distribution

protocol to establish label switching paths to set up primary and protection data

paths).

With respect to claim 13, Cao et al. discloses that sending a first predetermined

control message from a first switch to a second switch comprises includes identifying at

least one switch as a protection switch element, LSR C and LSR D, by the contents of

at least one control field sent to at least one switch, LSR E **(See paragraphs 23-24 and**

Figure 1 of Cao et al. for reference to LSR S using control fields to identify LSR C

and LSR D as protection switch elements and sending this control information

through the network to LSR E).

With respect to claim 14, Cao et al. discloses the working path being set up

loosely **(See paragraph 2 of Cao et al. for reference to prior art using loosely**

connected working and protection paths set up hop-by-hop).

With respect to claim 15, Cao et al. discloses the working path being set up

explicitly **(See paragraph 21 of Cao et al. for reference to explicitly setting up**

working and protection routing paths).

With respect to claim 16, Cao et al. discloses mapping labels to data routed

along the working path according to predetermined criteria that includes the quality of

service granted to routed data **(See paragraph 53 and Figure 2 of Cao et al. for**

reference to mapping labels routed along the first path according to

predetermined criteria including a type of service field, which includes quality of

service information).

With respect to claim 17, Cao et al. discloses a system for establishing a data

flow over a protection path in a data network **(See paragraph 24 and Figure 1 of Cao**

et al. for reference to switching to a secondary path when a primary path fails).

Cao et al. also discloses a plurality of switches, label switching routers, operable to

communicate data **(See paragraph 22 and Figure 1 of Cao et al. for reference to the**

communications system including label switching routers that use paths to

communicate data). Cao et al. further discloses a first one of switches, LSR S,

operable to establish a working path and a protection and a second one of the plurality

of switches, LSRs A, B, and E, that is downstream from the first switch being on the

working path **(See paragraph 23-24 and Figure 1 of Cao et al. for reference to**

sending a router request downstream to request an explicitly routed path

between source LSR S and destination LSR E that sets up a working path through

LSRs S, A, B, and E, with LRSs A, B, and E downstream from LSR S). Cao et al.

does not disclose that the second switch is operable to establish a reverse notification

path and send a reverse notification message upstream to the first switch in response to

receiving data from the first switch. Cao et al. also does not disclose a reverse

notification message operable to provide information related to the working path in order

to determine whether the data is to be re-routed from the working path to the protection

path.

With respect to claim 17, McAllister et al., in the field of communications,

discloses sending a message establishing a reverse notification path through the

network between the first and second switches in response to data received from the

first switch **(See column 9 line 47 to column 10 line 8 of McAllister et al. for reference to using a path from a second node to a first node to send "poll" and "stat" acknowledgement messages from the second node to the first node in response to protocol messages, the second message, sent from the first node).** McAllister et al. also discloses sending a third message over the reverse notification path the interruption of which is used to determine whether the data is to be re-routed from the working path to the protection path **(See column 9 line 47 to column 10 line 8 of McAllister et al. for reference to sending a "stat", or a third message, which the first node uses, by determining when the acknowledgement "stat" message was not received, or interrupted, to control protection switching from the second node to the first node).** Setting up a reverse notification path and sending signals over the path to a first, source, node has the advantage of allowing a first, source, node to learn about a failure in a data path and immediately stop sending packets that will be "lost" on the failed path before the source node switches to the secondary path and also allowing the source node to resend packets on the secondary path that may have been "lost" while the destination node was receiving packets through the failed path.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of McAllister et al., to combine setting up a reverse notification path and sending signals over the path to a first node to allow the first node to control protection switching, as suggested by McAllister et al., with the MPLS protection path system of Cao et al. with the motivation being to allow a first, source, node to learn about a failure in a data path and immediately stop sending

packets that will be "lost" on the failed path before the source node switches to the secondary path and also allow the source node to resend packets on the secondary path that may have been "lost" while the destination node was receiving packets through the failed path.

With respect to claims 18 and 20, Cao et al. does not disclose the first switch being a protection switch element operable to re-route data onto the protection path in accordance with the reverse notification message in response to not receiving the reverse notification message from the second switch within a predetermined time interval.

With respect to claims 18 and 20, McAllister et al. discloses that the first switch is a protection switch element operable to re-route data onto the protection path in accordance with the reverse notification message **(See column 9 line 47 to column 10 line 8 of McAllister et al. for reference to the source or ingress node, which is the first switch, re-routing the connection to a different path and for reference to sending a "stat", or a third message, which the first node uses, by determining when the acknowledgement "stat" message was not received, or interrupted, to control protection switching from the second node to the first node)**. Setting up a reverse notification path and sending signals over the path to a first, source, node has the advantage of allowing a first, source, node to learn about a failure in a data path and immediately stop sending packets that will be "lost" on the failed path before the source node switches to the secondary path and also allowing the source node to resend

packets on the secondary path that may have been "lost" while the destination node

was receiving packets through the failed path.

It would have been obvious to one of ordinary skill in the art at the time of the

invention, when presented with the work of McAllister et al., to combine setting up a

reverse notification path and sending signals over the path to a first node to allow the

first node to control protection switching, as suggested by McAllister et al., with the

MPLS protection path system of Cao et al. with the motivation being to allow a first,

source, node to learn about a failure in a data path and immediately stop sending

packets that will be "lost" on the failed path before the source node switches to the

secondary path and also allow the source node to resend packets on the secondary

path that may have been "lost" while the destination node was receiving packets

through the failed path.

With respect to claims 19 and 21, Cao et al. does not disclose the first switch

sending its own reverse notification message including information from the reverse

notification message received from the second switch, with the reverse notification

message informing the first switch of the status of the second switch and all other

switches downstream from the first switch on the working path.

With respect to claims 19 and 21, McAllister et al. discloses a first switch

sending and receiving reverse notification messages including the information from the

reverse notification messages received from all switches downstream from the first

switch on the working path **(See column 9 line 47 to column 10 line 8 of McAllister et**

al. for reference to the acknowledgement messages sent by the nodes containing

signaling messages for all virtual connections associate with a data link, meaning the content of each message is a compilation of the contents of acknowledgement messages from previous nodes, such that the acknowledgement message from the first node contains the information of the acknowledgement message from the second node). Sending a reversion notification message including the information from the reverse notification messages received from another switch has the advantage of allowing link status information to be propagated throughout the network so that all switches know the status of all system links.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of McAllister et al., to combine sending a reversion notification message including the information from the reverse notification messages received from another switch, as suggested by McAllister et al., with the MPLS protection path system of Cao et al. with the motivation being to allow link status information to be propagated throughout the network so that all switches know the status of all system links.

With respect to claims 22-24, Cao et al. does not disclose the second switch sending its reverse notification message directly to each of the switches including the particular switch that performs protection switching from the working path to the protection path with the reverse notification message including information pertaining to a failure in the working path.

With respect to claims 22-24, McAllister et al. discloses switches sending reverse notification messages directly to other switches including the switch that performs protection switching with the reverse notification message including information pertaining to a failure on the working path **(See column 9 line 47 to column 10 line 8 of McAllister et al. for reference to the acknowledgement messages being sent in a "poll" and "stat" format, meaning that a first source node will "poll" the status of a second node and the second node will respond with a "stat" message sent directly to the node that initiated the "poll" message and for reference to the "poll" and "stat" messages containing information pertaining to failures on the working path that is used by the first source node to perform protection switching).** Sending reverse notification messages directly to other switches including the switch that performs protection switching with the reverse notification message including information pertaining to a failure on the working path has the advantage of allowing the protection switching to be processed and performed by a single specific protection switch without using the resources of the other switches to process each individual reverse notification message.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of McAllister et al., to combine reverse notification messages directly to other switches including the switch that performs protection switching with the reverse notification message including information pertaining to a failure on the working path, as suggested by McAllister et al., with the MPLS protection path system of Cao et al. with the motivation being to allow the

protection switching to be processed and performed by a single specific protection

switch without using the resources of the other switches to process each individual

reverse notification message.

4.   Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Coe et al. in view of McAllister et al. as applied to claims 1, 2, 4, 5, 7, 8, 9, 10, 11, 13,

14, 15, and 16 above, and further in view of Aukia et al. (U.S. Pat. 6594268).

With respect to claims 3 and 12, the combination of Cao et al. and McAllister et

al. does not disclose that sending a first message is comprised of the step of adding a

protection messaging field, which carries protection pathway information between

switching elements, to an MPLS reservation protocol message.

Aukia et al., in the field of communications, discloses that sending a message is

comprised of the step of adding a protection messaging field, which carries protection

pathway information between switching elements, to an MPLS reservation protocol

message **(See column 9 line 60 to column 10 line 47 and Figure 2 of Aukia et al. for**

reference to control messages using RSVP protocol, which are used to carry

protection pathway information between network nodes). Using an MPLS

reservation protocol message to carry protection pathway information between

switching elements has the advantage of being able to share protection pathway

information between network elements using the current MPLS protocol, meaning that

the current MPLS protocol would not have to be changed in order to implement the

invention.

It would have been obvious for one of ordinary skill in the art at the time of the

invention, when presented with the work of Aukia et al. to combine the use of an MPLS

reservation protocol message of Aukia et al. with the MPLS protection path method of

Cao et al. and McAllister et al., with the motivation being to be able to share protection

pathway information between network elements using the current MPLS protocol,

meaning that the current MPLS protocol would not have to be changed in order to

implement the invention.

5.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao et al.

in view of McAllister et al. as applied to claims 1, 2, 4, 5, 7, 8, 9, 10, 11, 13, 14, 15, and

16 above, and further in view of Lemieux (U.S. Pat. 6452942).

With respect to claim 6, the combination of Cao et al. and McAllister et al does

not specifically disclose a step of label binding the first message for the second switch

to a third switch.

Lemieux, in the field of communications, discloses using label binding to

distribute information to other label switches in a network **(See column 5 line 45 to**

column 6 line 4 of Lemieux for reference to using label binding to distribute

information to other label switches in a network). Using label binding has the

advantage of being able to explicitly map data to specific label switching paths.

It would have been obvious to one of ordinary skill in the art at the time of the

invention, when presented with the work of Lemieux, to combine the label binding of

Lemieux with the MPLS data network protection paths of Cao et al. and McAllister et al.,

with the motivation being to be able to explicitly map data to specific label switching

paths.

Response to Arguments

6.   Applicant's arguments field on 11/8/2004 have been fully considered but they are

not persuasive.

In response to Applicant's argument that:

> "Thus, the McAllister, et al. patent does not send a third message from a
>
> second switch to a first switch in response to data being received at the
>
> second switch from the first switch as required by the claimed invention."
>
> (See page 9 of Applicant's remarks)

the Examiner respectfully disagrees. As shown in the rejections above, the

acknowledgement message system of McAllister et al. is implemented with a "poll" and

"stat" format. This means that a first switch will send a "poll" message to a second

switch, and the second switch will reply to the "poll" message with a "stat" message. In

this way a third message, the "stat" message, is sent from the second switch to the first

switch in response to data, the "poll" message, being received at the second switch

from the first switch.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E Mattis whose telephone number is (571) 272-3154. The examiner can normally be reached on M-F 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jem

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